

WHAT IS CLAIMED IS:

1. An information processing method for synchronization of disease progression data of individual patients, comprising:
 - receiving disease progression data in an aperiodic form;
 - representing the disease progression data as a set of functions having finite asymptotic values; and
 - clustering parameters of the set of functions,wherein the step of representing the disease progression data as a set of functions comprises transforming the functions into time invariant form and thereby synchronizing individual patient data that is clustered.
2. The information processing method according to claim 1, wherein the set of functions having finite asymptotic values comprises a set of logistic curves, and wherein the step of representing the disease progression data as a set of functions comprises fitting each variable for each patient to one of the set of logistic curves.
3. The information processing method according to claim 2, wherein the clustering step comprises using a nonlinear least squares technique.
4. The information processing method according to claim 3, wherein the nonlinear least squares technique comprises:
 - using a local Taylor's series expansion for a logistic function representative of a logistic curve;
 - computing a jacobian matrix to calculate an error covariance matrix for the fit of the function to the data; and
 - using the error covariance matrix as input to provide weighting for a distance function for use in a clustering algorithm.
5. The information processing method according to claim 1, wherein the clustering step includes using a statistical error in determining the function parameters as a weighting for use in a distance function.

6. The information processing method according to claim 1, wherein the step of transforming the functions into time invariant form comprises determining an unambiguous time point based on the shape of a function curve.

7. The information processing method according to claim 6, wherein the unambiguous time point comprises one of a x-intercept or inflection point of the function curve.

8. The information processing method according to claim 7, wherein the set of functions comprise logistic functions, and

wherein the step of transforming parameters of the set of logistic functions into time invariant form for disease progression data of a patient comprises:

determining an x-intercept of a linear portion of the logistic function curve for each variable; and

determining pair wise differences of x-intercepts for all the variables with respect to corresponding x-intercepts of base patterns, and using the determined pair wise differences information in the clustering step to cluster and synchronize the disease progression data of the patient to one of the base patterns.

9. The information processing method according to claim 1, wherein the step of receiving the disease progression data comprises filtering out periodic or cyclical data or transforming the periodic or cyclical data into aperiodic form.

10. A computer program product that causes, when executed, a computing system to synchronize disease progression data of individual patients by performing the steps comprising:

receiving disease progression data in an aperiodic form;
representing the disease progression data as a set of functions having finite asymptotic values; and
clustering parameters of the set of functions,

wherein the step of representing the disease progression data as a set of functions comprises transforming the functions into time invariant form and thereby synchronizing individual patient data that is clustered.

11. The computer program product according to claim 10, wherein the set of functions having finite asymptotic values comprises a set of logistic curves, and wherein the step of representing the disease progression data as a set of functions comprises fitting each variable for each patient to one of the set of logistic curves.

12. The computer program product according to claim 11, wherein the clustering step comprises using a nonlinear least squares technique.

13. The computer program product according to claim 10, wherein the step of transforming the functions into time invariant form comprises determining an unambiguous time point based on the shape of the function curve.

14. The computer program product according to claim 13, wherein the unambiguous time point comprises one of a x-intercept or inflection point of the function curve.

15. The computer program product according to claim 13, wherein the set of functions comprise a set of logistic functions and

wherein the step of transforming parameters of the set of logistic functions into time invariant form for disease progression data of a patient comprises:

determining an x-intercept of a linear portion of the logistic function curve for each variable; and

determining pair wise differences of x-intercepts for all the variables with respect to corresponding x-intercepts of base patterns, and using the determined pair wise differences information in the clustering step to cluster and synchronize the disease progression data of the patient to one of the base patterns.

16. The computer program product according to claim 10, wherein the step of receiving disease progression data comprises filtering out periodic or cyclical data or transforming the periodic or cyclical form into aperiodic form.

17. A system for synchronization of disease progression data of individual patients, comprising:
an input unit for receiving disease progression data in an aperiodic form; and
a computing unit configured to
represent the disease progression data as a set of functions having finite asymptotic values,
cluster parameters of the set of functions,
wherein the step of representing the disease progression data as a set of functions comprises transforming the functions into time invariant form and thereby synchronizing individual patient data that is clustered.

18. The system according to claim 17, wherein transforming the functions into time invariant form comprises determining any unambiguous time point based on the shape of a function curve.

19. The system according to claim 18, wherein the unambiguous time point comprises one of a x-intercept or inflection point of the function curve.

20. A system for synchronization of disease progression data of individual patients, comprising:
means for receiving disease progression data in an aperiodic form; and
means for representing the disease progression data as a set of functions having finite asymptotic values, and
means for clustering parameters of the set of functions,
wherein the step of representing the disease progression data as a set of functions comprises transforming the functions into time invariant form and thereby synchronizing individual patient data that is clustered.